

Research Group Network Analysis Report

1. Introduction

This report analyzes collaboration relationships within a research group using social network analysis (SNA). Based on the dataset coded into the graph, the members include Mensah, Freddie, Ama, Kojo, and Linda, representing five individuals engaged in academic or research-related communication. The graph is undirected, meaning that all connections represent mutual collaboration between partners.

2. Network Construction

The network is constructed from the following collaboration ties:

- Mensah ↔ Freddie
- Mensah ↔ Ama
- Mensah ↔ Kojo
- Ama ↔ Freddie
- Kojo ↔ Linda

These relationships form the full set of interactions in the group. Using this dataset, NetworkX generates a graph with five nodes and five edges, capturing all recorded collaborations. Because the graph is undirected, each pair listed above represents a two-way interaction.

The code also checks for isolated nodes—members with no collaborations at all—using `nx.isolates(G)`.

3. Results of the Network Analysis

3.1 Number of Nodes and Edges

- Number of nodes: 5
- Number of edges: 5

This indicates that all recorded individuals participate in at least one connection, and the group has a moderate level of collaboration.

3.2 Degree Distribution

Using the code's `G.degree()`, the degree values for each member are:

- Mensah: 3
- Freddie: 2
- Ama: 2
- Kojo: 2

- Linda: 1

The degree distribution shows that Mensah is the most central member, connected to three others. Freddie, Ama, and Kojo form a collaborative core with intermediate degrees, while Linda lies at the periphery with only one tie (to Kojo).

3.3 Isolated Nodes

The code identifies isolated nodes using `nx.isolates(G)`.

Result:

- Isolated nodes:

There are *no isolated members* in this dataset. Every individual has at least one recorded collaboration.